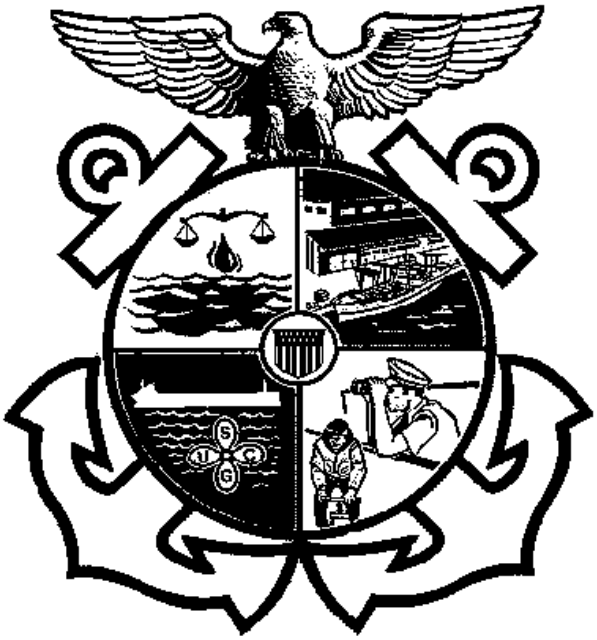
Machinery Inspector (Steam) (MS)



PQS Workbook

MS Qualification
Task Matrix

TSK #	TASK	DATE
MI20	Witness operational test of steam propulsion automation.	
MI21	Observe operational test of forced draft fans and shutdowns.	
MI27	Conduct an external examination of a watertube boiler.	
MI28	Conduct a waterside examination of a watertube boiler.	
MI29	Conduct a fireside examination of a watertube boiler.	
MI30	Conduct a fireside and external exam of an auxiliary/heating boiler.	
MI31	Conduct a waterside examination of an auxiliary/heating boiler.	
MI32	Conduct required mountings inspections.	
MI33	Conduct a hydrostatic test of the boiler(s).	
MI34	Witness the lifting and reseating of safety valves.	
MI35	Inspect main/auxiliary condensate and sea water circulating systems.	
MI36	Inspect feedwater system.	
MI37	Inspect main steam turbine.	
MI38	Ensure insulation on steam piping provided to reduce personnel hazard.	
MI39	Inspect thermal fluid heater.	
RT05	Complete MI qualification.	

Trainee's OJT Manual has been reviewed and I recommend a training qualification board be scheduled.

Training Officer: _____

Date: _____

Date Qualification Board Completed: _____

MS Tasks

Task Number	*OJT Task*	*Date Completed*	*Verifying Officer*
MI20	Witness operational test of steam propulsion automation. • Determine that the system has not been modified/jury rigged and is the same as that depicted in the procedures • Testing the automation system using the methods specified by approved procedure • Verify that automatic systems have not been bypassed or overridden by manual devices except as noted in approved test procedure • Verify proper operation of required alarms, shutdowns, controls and internal communications in accordance with the approved test procedure • Verify that bridge controls/alarms function in sync with engineroom control panel • Based on automation system testing, assess if vessel manning remains consistent with regulation/policies and determine corrective action, if necessary: – Temporary increase of engineroom manning – Further underway evaluation	_____	_____
MI21	Make operational test of forced draft fans and shutdowns, both local and remote.	_____	_____
MI27	Conduct an external examination of a watertube boiler. • Inner casing, outer casing, wind box (bulging, distortion, etc.) • Lagging • Tank tops beneath the boiler(s) • Condition of foundation/sliding feet • Headers/handholes evidence of leakage	_____	_____
MI28	Conduct a waterside examination of a watertube boiler. • Steam drum, mud drum, and headers (waterwall, superheater) • Drum internals: – Dry pipe – Main and chemical feed lines – Desuperheater and control desuperheater – Surface blow – Baffle plates – Tube sheet connections/ligament – Connections and attachments – Surface conditions (scaling, pitting, corrosion, erosion, fractures, etc.) • Verify number of tubes plugged	_____	_____

MS Tasks

Task Number	*OJT Task*	*Date Completed*	*Verifying Officer*
MI28 (cont'd.)	• Headers: – Hand hole seats – Tube connections – Welded connections – Division plates – Surface conditions		
MI29	Conduct a fireside examination of a watertube boiler. • Brick work • Corbel • Waterwall, screen, generating, and floor tubes (if fitted); (sagging, blistered, etc.) • Superheater tubes and supports • Burner • Amount of slag accumulation • Uptake and economizer • Soot blowers • Air heaters	_____	_____
MI30	Conduct a fireside and external examination of an auxiliary/heating boiler. • Furnace (distortion) • Combustion chamber (crown sheet, wrapper sheet, back sheets (distortion) • Boiler shell and heads • Stay bolts • Boiler saddles and foundations • Plating in way of mountings (wastage due to leaking valves and fittings) • Cracks in the plating due to flexing of the heads or leakage • Wastage around manhole gaskets • Note heat number and condition of fusible plugs	_____	_____
MI31	Conduct a waterside examination of an auxiliary/heating boiler. • Tubes (Pitting - determine general depth and tube type) • Internal surface conditions (scaling, pitting, corrosion, erosion)	_____	_____
MI32	Conduct required mountings inspections as follows: • 5-year mountings open: – Determine which valves to be opened – Inspect seat, disc, stem, integrity of valve body, condition of stem packing gland and gland ring bolts	_____	_____

MS Tasks

Task Number	*OJT Task*	*Date Completed*	*Verifying Officer*
MI32 (cont'd.)	• 10-year mountings removed, studs examined including inspection as per mountings open and: – Determination of valves to be removed for inspection of pressure piping between valve and boiler. – Representative studs removed from valve flanges for inspection to determine: ∗ Integrity of studs due to corrosion, neck down, deformation and thermal stress ∗ Proper grade installed for system pressure and temperature		
MI33	Conduct a hydrostatic test of the boiler(s). • Test conducted in conjunction with required fireside exam. • Appropriate test pressure (annual, quadrennial, repair) • Water temperature is within limits • Test pressure is achieved and held for the required time period • Blanks are installed in steam lines where necessary so a situation does not arise where a valve separates steam on one side from water on the other • Tube joints, header connect, and handhole plates tight • Main steam piping tested from boiler drum to throttle valve • All steam piping subject to main boiler pressure and greater than 3 inches nominal size is tested	_____	_____
MI34	Witness the lifting and reseating of superheater and drum safety valves including pilot operated valves. • Determine MAWP • Ensure that drum safety valve is set no higher than MAWP but above normal steaming range • Ensure that the superheater safety valve is set correctly in relation to drum valves. See manufacturer's boiler book for pilot operated valve • Ensure that the "blow down" falls within 2-4% of the set pressure for each valve • Ensure that there is no simmering or chattering • Test hand relieving gear • Ensure integrity of escape piping	_____	_____
MI35	Inspect main and auxiliary condensate and sea water circulating systems. • Determine condition of sea water piping, valves, and expansion joints • Determine condition of main and auxiliary condensers • Determine condition of condensate piping. • Witness operation of sea water circulating and condensate	_____	_____

MS Tasks

Task Number	*OJT Task*	*Date Completed*	*Verifying Officer*
	pumps		
MI36	Inspect feedwater system. • Determine condition of piping and valves • Ensure that two methods of determining boiler water levels are operable • Witness operation of feed pumps • Examine make up feed evaporator externally • Test operation of feedwater regulators if not part of automation • Externally examine feedwater headwaters	_____	_____
MI37	Inspect main steam turbine. • Determine condition of foundations • Governor • Throttles • Instrumentation operable • Jacking gear functions • Lube oil systems	_____	_____
MI38	Ensure insulation is provided to reduce personnel hazard.	_____	_____
MI39	Inspect thermal fluid heater. • External fittings • Mountings opened or removed if deemed necessary • Hydrostatic test • Relief valve tested • Automation tested	_____	_____
RT05	Complete MI qualification.	_____	_____

DATE	LOCATION	VESSEL NAME	VESSEL CLASS	INSPECTION TYPE	LEAD INSPECTOR

NOTES

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